Artificial Gravity Research Project Overview

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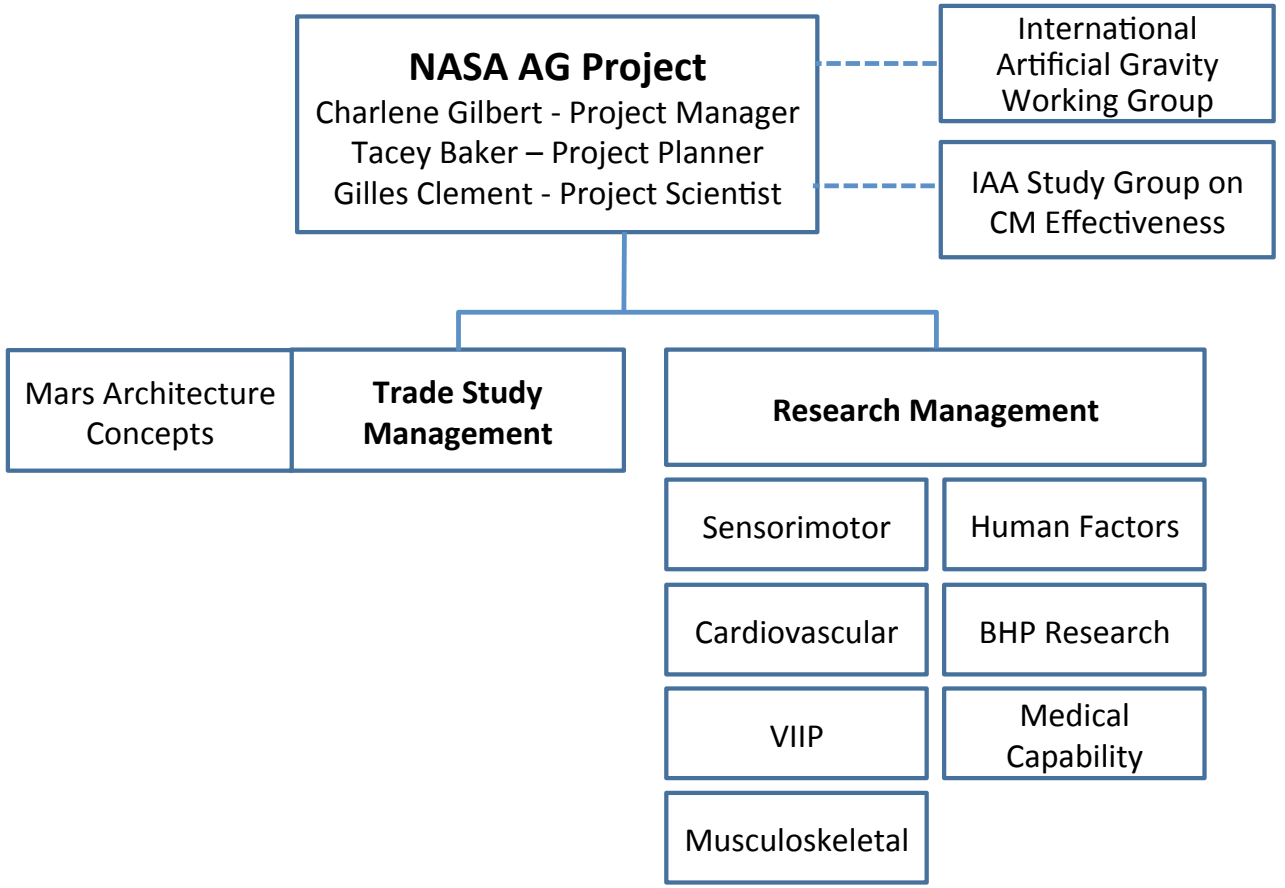
NASA AG Project

- **Goal**
  - Determine the design trade space associated with AG for Mars DRM vehicles and habitats.
- **Objectives**
  - Implement an evidence-based, peer-reviewed, coordinated R&D project to investigate AG.
  - Determine the optimal design characteristics for a AG countermeasure.
- **Milestone**
  - Decision criteria whether AG can protect crew health and performance during human deep space missions expected NET 2022.

AG Project Structure



AG Project Status

- **March 2014** – HRP approval to initiate the Artificial Gravity project to develop evidence-based recommendations for or against the use of AG in deep space transit vehicles by 2022.
- **September 2014** – Creation of Intern'l AG Working Group as a sub-group of the International Countermeasure Group.
- **December 2014** – External AG Advisory Panel.
- **March 2015** – Evidence Report on Artificial Gravity. Available at: http://www.xxx.xxx
- **May 2015** – Research Plan, in progress.
- **June 2015** – Project Management Plan, in review.
- **July 2015** – Research solicitation.

AG Research Plan

1. **AG Level**
   - G dose-physiological response relationship
   - Humans, rodents, cells
   - Parabolic flight, unloading, centrifugation, bioreactor, random positioning machine, computational models
2. **AG Duration and Frequency**
   - Continuous rotation
   - Intermittent rotation
3. **Health Consequences of AG**
   - Cross-coupled and Coriolis accelerations
   - Gravity gradient
   - Intracranial pressure
4. **Validation of AG Prescription**
   - Comparison between animal centrifugation on the ground and in space
   - Tests of a human centrifuge in space

Research Plan Summary